#9

1

SEQUENCE LISTING

<110> HIATT, ANDREW C.
      HEIN, MICH B.

<120> METHODS FOR PRODUCING IMMUNOGLOBULINS CONTAINING
      PROTECTION PROTEINS IN PLANTS AND THEIR USE

<130> EPI3002E

<140> 09/982,107
<141> 2001-10-16

<160> 19

<170> PatentIn Ver. 2.1

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gcc atg gct ctc ttc ttg ctc acc tgc ctg ctg gct gtc ttt tca gcg   168
    Met Ala Leu Phe Leu Leu Thr Cys Leu Leu Ala Val Phe Ser Ala
    1   5   10   15

gcc acg gca caa agc tcc tta ttg ggt ccc agc tcc ata ttt ggt ccc   216
Ala Thr Ala Gln Ser Ser Leu Leu Gly Pro Ser Ser Ile Phe Gly Pro
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ggg gag gtg aat gtt ttg gaa ggc gac tcg gtg tcc atc aca tgc tac   264
Gly Glu Val Asn Val Leu Glu Gly Asp Ser Val Ser Ile Thr Cys Tyr
            35   40   45

tac cca aca acc tcc gtc acc cgg cac agc cgg aag ttc tgg tgc cgg   312
Tyr Pro Thr Thr Ser Val Thr Arg His Ser Arg Lys Phe Trp Cys Arg
        50   55   60

gaa gag gag agc ggc cgc tgc gtg acg ctt gcc tcg acc ggc tac acg   360
Glu Glu Glu Ser Gly Arg Cys Val Thr Leu Ala Ser Thr Gly Tyr Thr
    65   70   75

tcc cag gaa tac tcc ggg aga ggc aag ctc acc gac ttc cct gat aaa   408
Ser Gln Glu Tyr Ser Gly Arg Gly Lys Leu Thr Asp Phe Pro Asp Lys
80   85   90   95

ggg gag ttt gtg gtg act gtt gac caa ctc acc cag aac gac tca ggg   456
Gly Glu Phe Val Val Thr Val Asp Gln Leu Thr Gln Asn Asp Ser Gly
                100   105   110

agc tac aag tgt ggc gtg gga gtc aac ggc cgt ggc ctg gac ttc ggt   504
Ser Tyr Lys Cys Gly Val Gly Val Asn Gly Arg Gly Leu Asp Phe Gly
            115   120   125

gtc aac gtg ctg gtc agc cag aag cca gag cct gat gac gtt gtt tac   552
Val Asn Val Leu Val Ser Gln Lys Pro Glu Pro Asp Asp Val Val Tyr
            130   135   140

aaa caa tat gag agt tat aca gta acc atc acc tgc cct ttc aca tat   600
Lys Gln Tyr Glu Ser Tyr Thr Val Thr Ile Thr Cys Pro Phe Thr Tyr
            145   150   155

gcg act agg caa cta aag aag tcc ttt tac aag gtg gaa gac ggg gaa   648
Ala Thr Arg Gln Leu Lys Lys Ser Phe Tyr Lys Val Glu Asp Gly Glu
160   165   170   175

ctt gta ctc atc att gat tcc agc agt aag gag gca aag gac ccc agg   696
Leu Val Leu Ile Ile Asp Ser Ser Ser Lys Glu Ala Lys Asp Pro Arg
                 180   185   190

tat aag ggc aga ata acg ttg cag atc caa agt acc aca gca aaa gaa   744
Tyr Lys Gly Arg Ile Thr Leu Gln Ile Gln Ser Thr Thr Ala Lys Glu
            195   200   205

ttc aca gtc acc atc aag cat ttg cag ctc aat gat gct ggg cag tat   792
Phe Thr Val Thr Ile Lys His Leu Gln Leu Asn Asp Ala Gly Gln Tyr
           210   215   220

gtc tgc cag agt gga agc gac ccc act gct gaa gaa cag aac gtt gac   840
Val Cys Gln Ser Gly Ser Asp Pro Thr Ala Glu Glu Gln Asn Val Asp
          225   230   235

ctc cga ctg cta act cct ggt ctg ctc tat gga aac ctg ggg ggc tcg   888
Leu Arg Leu Leu Thr Pro Gly Leu Leu Tyr Gly Asn Leu Gly Gly Ser
240   245   250   255

gtg acc ttt gaa tgt gcc ctg gac tct gaa gac gca aac gcg gta gca   936
Val Thr Phe Glu Cys Ala Leu Asp Ser Glu Asp Ala Asn Ala Val Ala
                 260   265   270

tcc ttg cgc cag gtt agg ggt ggc aat gtg gtc att gac agc cag ggg   984
Ser Leu Arg Gln Val Arg Gly Gly Asn Val Val Ile Asp Ser Gln Gly
            275   280   285

aca ata gat cca gcc ttc gag ggc agg atc ctg ttc acc aag gct gag   1032
Thr Ile Asp Pro Ala Phe Glu Gly Arg Ile Leu Phe Thr Lys Ala Glu
           290   295   300

aac ggc cac ttc agt gta gtg atc gca ggc ctg agg aag gaa gac aca   1080
Asn Gly His Phe Ser Val Val Ile Ala Gly Leu Arg Lys Glu Asp Thr
          305   310   315

ggg aac tat ctg tgc gga gtc cag tcc aat ggt cag tct ggg gat ggg   1128
Gly Asn Tyr Leu Cys Gly Val Gln Ser Asn Gly Gln Ser Gly Asp Gly
320   325   330   335

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ccc acc cag ctt cgg caa ctc ttc gtc aat gaa gag atc gac gtg tcc    1176
Pro Thr Gln Leu Arg Gln Leu Phe Val Asn Glu Glu Ile Asp Val Ser
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cgc agc ccc cct gtg ttg aag ggc ttt cca gga ggc tcc gtg acc ata    1224
Arg Ser Pro Pro Val Leu Lys Gly Phe Pro Gly Gly Ser Val Thr Ile
            355             360             365

cgc tgc ccc tac aac ccg aag aga agc gac agc cac ctg cag ctg tat    1272
Arg Cys Pro Tyr Asn Pro Lys Arg Ser Asp Ser His Leu Gln Leu Tyr
            370             375             380

ctc tgg gaa ggg agt caa acc cgc cat ctg ctg gtg gac agc ggc gag    1320
Leu Trp Glu Gly Ser Gln Thr Arg His Leu Leu Val Asp Ser Gly Glu
            385             390             395

ggg ctg gtt cag aaa gac tac aca ggc agg ctg gcc ctg ttc gaa gag    1368
Gly Leu Val Gln Lys Asp Tyr Thr Gly Arg Leu Ala Leu Phe Glu Glu
400             405             410             415

cct ggc aat ggc acc ttc tca gtc gtc ctc aac cag ctc act gcc gag    1416
Pro Gly Asn Gly Thr Phe Ser Val Val Leu Asn Gln Leu Thr Ala Glu
            420             425             430

gat gaa ggc ttc tac tgg tgt gtc agc gat gac gat gag tcc ctg acg    1464
Asp Glu Gly Phe Tyr Trp Cys Val Ser Asp Asp Asp Glu Ser Leu Thr
            435             440             445

act tcg gtg aag ctc cag atc gtt gac gga gaa cca agc ccc acg atc    1512
Thr Ser Val Lys Leu Gln Ile Val Asp Gly Glu Pro Ser Pro Thr Ile
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gac aag ttc act gct gtg cag gga gag cct gtt gag atc acc tgc cac    1560
Asp Lys Phe Thr Ala Val Gln Gly Glu Pro Val Glu Ile Thr Cys His
            465             470             475

ttc cca tgc aaa tac ttc tcc tcc gag aag tac tgg tgc aag tgg aat    1608
Phe Pro Cys Lys Tyr Phe Ser Ser Glu Lys Tyr Trp Cys Lys Trp Asn
480             485             490             495

gac cat ggc tgc gag gac ctg ccc act aag ctc agc tcc agc ggc gac    1656
Asp His Gly Cys Glu Asp Leu Pro Thr Lys Leu Ser Ser Ser Gly Asp
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ctt gtg aaa tgc aac aac aac ctg gtc ctc acc ctg acc ttg gac tcg    1704
Leu Val Lys Cys Asn Asn Asn Leu Val Leu Thr Leu Thr Leu Asp Ser
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gtc agc gaa gat gac gag ggc tgg tac tgg tgt ggc gcg aaa gac ggg    1752
Val Ser Glu Asp Asp Glu Gly Trp Tyr Trp Cys Gly Ala Lys Asp Gly
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cac gag ttt gaa gag gtt gcg gcc gtc agg gtg gag ctg aca gag cca    1800
His Glu Phe Glu Glu Val Ala Ala Val Arg Val Glu Leu Thr Glu Pro
            545             550             555
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gcc aag gta gct gtc gag cca gcc aag gta cct gtc gac cca gcc aag      1848
Ala Lys Val Ala Val Glu Pro Ala Lys Val Pro Val Asp Pro Ala Lys
560                 565                 570                 575

gca gcc ccc gcg cct gct gag gag aag gcc aag gcg cgg tgc cca gtg      1896
Ala Ala Pro Ala Pro Ala Glu Glu Lys Ala Lys Ala Arg Cys Pro Val
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ccc agg aga agg cag tgg tac cca ttg tca agg aag ctg aga aca agt      1944
Pro Arg Arg Arg Gln Trp Tyr Pro Leu Ser Arg Lys Leu Arg Thr Ser
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tgt cca gaa cct cgg ctc ctt gcg gag gag gta gca gtg cag agt gcg      1992
Cys Pro Glu Pro Arg Leu Leu Ala Glu Glu Val Ala Val Gln Ser Ala
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gaa gac cca gcc agt ggg agc aga gcg tct gtg gat gcc agc agt gct      2040
Glu Asp Pro Ala Ser Gly Ser Arg Ala Ser Val Asp Ala Ser Ser Ala
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tcg gga caa agc ggg agt gcc aaa gta ctg atc tcc acc ctg gtg ccc      2088
Ser Gly Gln Ser Gly Ser Ala Lys Val Leu Ile Ser Thr Leu Val Pro
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ttg ggg ctg gtg ctg gca gcg ggg gcc atg gcc gtg gcc ata gcc aga      2136
Leu Gly Leu Val Leu Ala Ala Gly Ala Met Ala Val Ala Ile Ala Arg
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gcc cgg cac agg agg aac gtg gac cga gtt tcc atc gga agc tac agg      2184
Ala Arg His Arg Arg Asn Val Asp Arg Val Ser Ile Gly Ser Tyr Arg
                675                 680                 685

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Thr Asp Ile Ser Met Ser Asp Leu Glu Asn Ser Arg Glu Phe Gly Ala
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att gac aac cca agc gcc tgc ccc gat gcc cgg gag acg gcc ctc gga      2280
Ile Asp Asn Pro Ser Ala Cys Pro Asp Ala Arg Glu Thr Ala Leu Gly
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Gly Lys Asp Glu Leu Ala Thr Ala Thr Glu Ser Thr Val Glu Ile Glu
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Glu Pro Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala Asp Leu Ala
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tac tca gct ttc ctg ctc caa tcc aac acc ata gct gct gag cac caa      2424
Tyr Ser Ala Phe Leu Leu Gln Ser Asn Thr Ile Ala Ala Glu His Gln
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gat ggc ccc aag gag gcc tag gcacagccgg ccaccgccgc cgccgccacc         2475
Asp Gly Pro Lys Glu Ala
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Glu Val Asn Val Leu Glu Gly Asp Ser Val Ser Ile Thr Cys Tyr Tyr
            35                  40                  45

Pro Thr Thr Ser Val Thr Arg His Ser Arg Lys Phe Trp Cys Arg Glu
        50                  55                  60

Glu Glu Ser Gly Arg Cys Val Thr Leu Ala Ser Thr Gly Tyr Thr Ser
    65                  70                  75                  80

Gln Glu Tyr Ser Gly Arg Gly Lys Leu Thr Asp Phe Pro Asp Lys Gly
                85                  90                  95
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Glu Phe Val Val Thr Val Asp Gln Leu Thr Gln Asn Asp Ser Gly Ser
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Tyr Lys Cys Gly Val Gly Val Asn Gly Arg Gly Leu Asp Phe Gly Val
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Asn Val Leu Val Ser Gln Lys Pro Glu Pro Asp Asp Val Val Tyr Lys
    130             135             140

Gln Tyr Glu Ser Tyr Thr Val Thr Ile Thr Cys Pro Phe Thr Tyr Ala
145             150             155             160

Thr Arg Gln Leu Lys Lys Ser Phe Tyr Lys Val Glu Asp Gly Glu Leu
            165             170             175

Val Leu Ile Ile Asp Ser Ser Ser Lys Glu Ala Lys Asp Pro Arg Tyr
            180             185             190

Lys Gly Arg Ile Thr Leu Gln Ile Gln Ser Thr Thr Ala Lys Glu Phe
        195             200             205

Thr Val Thr Ile Lys His Leu Gln Leu Asn Asp Ala Gly Gln Tyr Val
    210             215             220

Cys Gln Ser Gly Ser Asp Pro Thr Ala Glu Glu Gln Asn Val Asp Leu
225             230             235             240

Arg Leu Leu Thr Pro Gly Leu Leu Tyr Gly Asn Leu Gly Gly Ser Val
            245             250             255

Thr Phe Glu Cys Ala Leu Asp Ser Glu Asp Ala Asn Ala Val Ala Ser
        260             265             270

Leu Arg Gln Val Arg Gly Gly Asn Val Val Ile Asp Ser Gln Gly Thr
        275             280             285

Ile Asp Pro Ala Phe Glu Gly Arg Ile Leu Phe Thr Lys Ala Glu Asn
    290             295             300

Gly His Phe Ser Val Val Ile Ala Gly Leu Arg Lys Glu Asp Thr Gly
305             310             315             320

Asn Tyr Leu Cys Gly Val Gln Ser Asn Gly Gln Ser Gly Asp Gly Pro
            325             330             335

Thr Gln Leu Arg Gln Leu Phe Val Asn Glu Glu Ile Asp Val Ser Arg
            340             345             350

Ser Pro Pro Val Leu Lys Gly Phe Pro Gly Gly Ser Val Thr Ile Arg
        355             360             365

Cys Pro Tyr Asn Pro Lys Arg Ser Asp Ser His Leu Gln Leu Tyr Leu
    370             375             380

Trp Glu Gly Ser Gln Thr Arg His Leu Leu Val Asp Ser Gly Glu Gly
385             390             395             400
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Leu Val Gln Lys Asp Tyr Thr Gly Arg Leu Ala Leu Phe Glu Glu Pro
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Gly Asn Gly Thr Phe Ser Val Val Leu Asn Gln Leu Thr Ala Glu Asp
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Glu Gly Phe Tyr Trp Cys Val Ser Asp Asp Asp Glu Ser Leu Thr Thr
            435   440   445

Ser Val Lys Leu Gln Ile Val Asp Gly Glu Pro Ser Pro Thr Ile Asp
    450   455   460

Lys Phe Thr Ala Val Gln Gly Glu Pro Val Glu Ile Thr Cys His Phe
465   470   475   480

Pro Cys Lys Tyr Phe Ser Ser Glu Lys Tyr Trp Cys Lys Trp Asn Asp
            485   490   495

His Gly Cys Glu Asp Leu Pro Thr Lys Leu Ser Ser Ser Gly Asp Leu
            500   505   510

Val Lys Cys Asn Asn Asn Leu Val Leu Thr Leu Thr Leu Asp Ser Val
            515   520   525

Ser Glu Asp Asp Glu Gly Trp Tyr Trp Cys Gly Ala Lys Asp Gly His
    530   535   540

Glu Phe Glu Glu Val Ala Ala Val Arg Val Glu Leu Thr Glu Pro Ala
545   550   555   560

Lys Val Ala Val Glu Pro Ala Lys Val Pro Val Asp Pro Ala Lys Ala
            565   570   575

Ala Pro Ala Pro Ala Glu Glu Lys Ala Lys Ala Arg Cys Pro Val Pro
            580   585   590

Arg Arg Arg Gln Trp Tyr Pro Leu Ser Arg Lys Leu Arg Thr Ser Cys
    595   600   605

Pro Glu Pro Arg Leu Leu Ala Glu Glu Val Ala Val Gln Ser Ala Glu
    610   615   620

Asp Pro Ala Ser Gly Ser Arg Ala Ser Val Asp Ala Ser Ser Ala Ser
625   630   635   640

Gly Gln Ser Gly Ser Ala Lys Val Leu Ile Ser Thr Leu Val Pro Leu
            645   650   655

Gly Leu Val Leu Ala Ala Gly Ala Met Ala Val Ala Ile Ala Arg Ala
            660   665   670

Arg His Arg Arg Asn Val Asp Arg Val Ser Ile Gly Ser Tyr Arg Thr
    675   680   685

Asp Ile Ser Met Ser Asp Leu Glu Asn Ser Arg Glu Phe Gly Ala Ile
690   695   700

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Asp Asn Pro Ser Ala Cys Pro Asp Ala Arg Glu Thr Ala Leu Gly Gly
705             710             715             720

Lys Asp Glu Leu Ala Thr Ala Thr Glu Ser Thr Val Glu Ile Glu Glu
            725             730             735

Pro Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala Asp Leu Ala Tyr
        740             745             750

Ser Ala Phe Leu Leu Gln Ser Asn Thr Ile Ala Ala Glu His Gln Asp
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gctaaaacat tgcacaggag aagtcggcct gagtggtgcg gcgctcggga cccaccagca 180

atgctgctct tcgtgctcac ctgcctgctg gcggtcttcc cagccatctc cacg aag    237
                                                            Lys
                                                            1

agt ccc ata ttt ggt ccc gag gag gtg aat agt gtg gaa ggt aac tca  285
Ser Pro Ile Phe Gly Pro Glu Glu Val Asn Ser Val Glu Gly Asn Ser
            5               10              15

gtg tcc atc acg tgc tac tac cca ccc acc tct gtc aac cgg cac acc  333
Val Ser Ile Thr Cys Tyr Tyr Pro Pro Thr Ser Val Asn Arg His Thr
        20              25              30

cgg aag tac tgg tgc cgg cag gga gct aga ggt ggc tgc ata acc ctc  381
Arg Lys Tyr Trp Cys Arg Gln Gly Ala Arg Gly Gly Cys Ile Thr Leu
        35              40              45

atc tcc tcg gag ggc tac gtc tcc agc aaa tat gca ggc agg gct aac  429
Ile Ser Ser Glu Gly Tyr Val Ser Ser Lys Tyr Ala Gly Arg Ala Asn
 50              55              60              65

ctc acc aac ttc ccg gag aac ggc aca ttt gtg gtg aac att gcc cag  477
Leu Thr Asn Phe Pro Glu Asn Gly Thr Phe Val Val Asn Ile Ala Gln
            70              75              80
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ctg agc cag gat gac tcc ggg cgc tac aag tgt ggc ctg ggc atc aat    525
Leu Ser Gln Asp Asp Ser Gly Arg Tyr Lys Cys Gly Leu Gly Ile Asn
            85              90                  95

agc cga ggc ctg tcc ttt gat gtc agc ctg gag gtc agc cag ggt cct    573
Ser Arg Gly Leu Ser Phe Asp Val Ser Leu Glu Val Ser Gln Gly Pro
            100             105                 110

ggg ctc cta aat gac act aaa gtc tac aca gtg gac ctg ggc aga acg    621
Gly Leu Leu Asn Asp Thr Lys Val Tyr Thr Val Asp Leu Gly Arg Thr
    115             120                 125

gtg acc atc aac tgc cct ttc aag act gag aat gct caa aag agg aag    669
Val Thr Ile Asn Cys Pro Phe Lys Thr Glu Asn Ala Gln Lys Arg Lys
130             135                 140                 145

tcc ttg tac aag cag ata ggc ctg tac cct gtg ctg gtc atc gac tcc    717
Ser Leu Tyr Lys Gln Ile Gly Leu Tyr Pro Val Leu Val Ile Asp Ser
            150                 155                 160

agt ggt tat gtg aat ccc aac tat aca gga aga ata cgc ctt gat att    765
Ser Gly Tyr Val Asn Pro Asn Tyr Thr Gly Arg Ile Arg Leu Asp Ile
            165                 170                 175

cag ggt act ggc cag tta ctg ttc agc gtt gtc atc aac caa ctc agg    813
Gln Gly Thr Gly Gln Leu Leu Phe Ser Val Val Ile Asn Gln Leu Arg
            180                 185                 190

ctc agc gat gct ggg cag tat ctc tgc cag gct ggg gat gat tcc aat    861
Leu Ser Asp Ala Gly Gln Tyr Leu Cys Gln Ala Gly Asp Asp Ser Asn
    195                 200                 205

agt aat aag aag aat gct gac ctc caa gtg cta aag ccc gag ccc gag    909
Ser Asn Lys Lys Asn Ala Asp Leu Gln Val Leu Lys Pro Glu Pro Glu
210             215                 220                 225

ctg gtt tat gaa gac ctg agg ggc tca gtg acc ttc cac tgt gcc ctg    957
Leu Val Tyr Glu Asp Leu Arg Gly Ser Val Thr Phe His Cys Ala Leu
            230                 235                 240

ggc cct gag gtg gca aac gtg gcc aaa ttt ctg tgc cga cag agc agt   1005
Gly Pro Glu Val Ala Asn Val Ala Lys Phe Leu Cys Arg Gln Ser Ser
            245                 250                 255

ggg gaa aac tgt gac gtg gtc gtc aac acc ctg ggg aag agg gcc cca   1053
Gly Glu Asn Cys Asp Val Val Val Asn Thr Leu Gly Lys Arg Ala Pro
            260                 265                 270

gcc ttt gag ggc agg atc ctg ctc aac ccc cag gac aag gat ggc tca   1101
Ala Phe Glu Gly Arg Ile Leu Leu Asn Pro Gln Asp Lys Asp Gly Ser
    275                 280                 285

ttc agt gtg gtg atc aca ggc ctg agg aag gag gat gca ggg cgc tac   1149
Phe Ser Val Val Ile Thr Gly Leu Arg Lys Glu Asp Ala Gly Arg Tyr
290                 295                 300                 305
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ctg tgt gga gcc cat tcg gat ggt cag ctg cag gaa ggc tcg cct atc    1197
Leu Cys Gly Ala His Ser Asp Gly Gln Leu Gln Glu Gly Ser Pro Ile
            310                 315                 320

cag gcc tgg caa ctc ttc gtc aat gag gag tcc acg att ccc cgc agc    1245
Gln Ala Trp Gln Leu Phe Val Asn Glu Glu Ser Thr Ile Pro Arg Ser
            325                 330                 335

ccc act gtg gtg aag ggg gtg gca gga agc tct gtg gcc gtg ctc tgc    1293
Pro Thr Val Val Lys Gly Val Ala Gly Ser Ser Val Ala Val Leu Cys
            340                 345                 350

ccc tac aac cgt aag gaa agc aaa agc atc aag tac tgg tgt ctc tgg    1341
Pro Tyr Asn Arg Lys Glu Ser Lys Ser Ile Lys Tyr Trp Cys Leu Trp
    355                 360                 365

gaa ggg gcc cag aat ggc cgc tgc ccc ctg ctg gtg gac agc gag ggg    1389
Glu Gly Ala Gln Asn Gly Arg Cys Pro Leu Leu Val Asp Ser Glu Gly
370                 375                 380                 385

tgg gtt aag gcc cag tac gag ggc cgc ctc tcc ctg ctg gag gag cca    1437
Trp Val Lys Ala Gln Tyr Glu Gly Arg Leu Ser Leu Leu Glu Glu Pro
            390                 395                 400

ggc aac ggc acc ttc act gtc atc ctc aac cag ctc acc agc cgg gac    1485
Gly Asn Gly Thr Phe Thr Val Ile Leu Asn Gln Leu Thr Ser Arg Asp
            405                 410                 415

gcc ggc ttc tac tgg tgt ctg acc aac ggc gat act ctc tgg agg acc    1533
Ala Gly Phe Tyr Trp Cys Leu Thr Asn Gly Asp Thr Leu Trp Arg Thr
            420                 425                 430

acc gtg gag atc aag att atc gaa gga gaa cca aac ctc aag gta cca    1581
Thr Val Glu Ile Lys Ile Ile Glu Gly Glu Pro Asn Leu Lys Val Pro
            435                 440                 445

ggg aat gtc acg gct gtg ctg gga gag act ctc aag gtc ccc tgt cac    1629
Gly Asn Val Thr Ala Val Leu Gly Glu Thr Leu Lys Val Pro Cys His
450                 455                 460                 465

ttt cca tgc aaa ttc tcc tcg tac gag aaa tac tgg tgc aag tgg aat    1677
Phe Pro Cys Lys Phe Ser Ser Tyr Glu Lys Tyr Trp Cys Lys Trp Asn
            470                 475                 480

aac acg ggc tgc cag gcc ctg ccc agc caa gac gaa ggc ccc agc aag    1725
Asn Thr Gly Cys Gln Ala Leu Pro Ser Gln Asp Glu Gly Pro Ser Lys
            485                 490                 495

gcc ttc gtg aac tgt gac gag aac agc cgg ctt gtc tcc ctg acc ctg    1773
Ala Phe Val Asn Cys Asp Glu Asn Ser Arg Leu Val Ser Leu Thr Leu
            500                 505                 510

aac ctg gtg acc agg gct gat gag ggc tgg tac tgg tgt gga gtg aag    1821
Asn Leu Val Thr Arg Ala Asp Glu Gly Trp Tyr Trp Cys Gly Val Lys
    515                 520                 525
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cag ggc cac ttc tat gga gag act gca gcc gtc tat gtg gca gtt gaa    1869
Gln Gly His Phe Tyr Gly Glu Thr Ala Ala Val Tyr Val Ala Val Glu
530             535             540             545

gag agg aag gca gcg ggg tcc cgc gat gtc agc cta gcg aag gca gac    1917
Glu Arg Lys Ala Ala Gly Ser Arg Asp Val Ser Leu Ala Lys Ala Asp
            550             555             560

gct gct cct gat gag aag gtg cta gac tct ggt ttt cgg gag att gag    1965
Ala Ala Pro Asp Glu Lys Val Leu Asp Ser Gly Phe Arg Glu Ile Glu
            565             570             575

aac aaa gcc att cag gat ccc agg ctt ttt gca gag gaa aag gcg gtg    2013
Asn Lys Ala Ile Gln Asp Pro Arg Leu Phe Ala Glu Glu Lys Ala Val
        580             585             590

gca gat aca aga gat caa gcc gat ggg agc aga gca tct gtg gat tcc    2061
Ala Asp Thr Arg Asp Gln Ala Asp Gly Ser Arg Ala Ser Val Asp Ser
        595             600             605

ggc agc tct gag gaa caa ggt gga agc tcc aga gcg ctg gtc tcc acc    2109
Gly Ser Ser Glu Glu Gln Gly Gly Ser Ser Arg Ala Leu Val Ser Thr
610             615             620             625

ctg gtg ccc ctg ggc ctg gtg ctg gca gtg gga gcc gtg gct gtg ggg    2157
Leu Val Pro Leu Gly Leu Val Leu Ala Val Gly Ala Val Ala Val Gly
            630             635             640

gtg gcc aga gcc cgg cac agg aag aac gtc gac cga gtt tca atc aga    2205
Val Ala Arg Ala Arg His Arg Lys Asn Val Asp Arg Val Ser Ile Arg
            645             650             655

agc tac agg aca gac att agc atg tca gac ttc gag aac tcc agg gaa    2253
Ser Tyr Arg Thr Asp Ile Ser Met Ser Asp Phe Glu Asn Ser Arg Glu
            660             665             670

ttt gga gcc aat gac aac atg gga gcc tct tcg atc act cag gag aca    2301
Phe Gly Ala Asn Asp Asn Met Gly Ala Ser Ser Ile Thr Gln Glu Thr
        675             680             685

tcc ctc gga gga aaa gaa gag ttt gtt gcc acc act gag agc acc aca    2349
Ser Leu Gly Gly Lys Glu Glu Phe Val Ala Thr Thr Glu Ser Thr Thr
690             695             700             705

gag acc aaa gaa ccc aag aag gca aaa agg tca tcc aag gag gaa gcc    2397
Glu Thr Lys Glu Pro Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala
            710             715             720

gag atg gcc tac aaa gac ttc ctg ctc cag tcc agc acc gtg gcc gcc    2445
Glu Met Ala Tyr Lys Asp Phe Leu Leu Gln Ser Ser Thr Val Ala Ala
            725   .           730             735

gag gcc cag gac ggc ccc cag gaa gcc tagacggtgt cgccgcctgc          2492
Glu Ala Gln Asp Gly Pro Gln Glu Ala
            740             745

tccctgcacc catgacaatc accttcagaa tcatgtcgat cctggggggcc ctcagctcct 2552
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ggggacccca ctccctgctc taacacctgc ctaggttttt cctactgtcc tcagaggcgt 2612

gctggtcccc tcctcagtga catcaaagcc tggcctaatt gttcctattg gggatgaggg 2672

tggcatgagg aggtcccact tgcaacttct ttctgttgag agaacctcag gtacggagaa 2732

gaatagaggt cctcatgggt cccttgaagg aagagggacc agggtgggag agctgattgc 2792

agaaaggaga gacgtgcagc gcccctctgc acccttatca tgggatgtca acagaatttt 2852

ttccctccac tccatccctc cctcccgtcc ttcccctctt cttctttcct taccatcaaa 2912

agatgta                                                       2919
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            20                  25                  30

Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala Arg Gly Gly Cys Ile Thr
        35                  40                  45

Leu Ile Ser Ser Glu Gly Tyr Val Ser Ser Lys Tyr Ala Gly Arg Ala
    50                  55                  60

Asn Leu Thr Asn Phe Pro Glu Asn Gly Thr Phe Val Val Asn Ile Ala
65                  70                  75                  80

Gln Leu Ser Gln Asp Asp Ser Gly Arg Tyr Lys Cys Gly Leu Gly Ile
                85                  90                  95

Asn Ser Arg Gly Leu Ser Phe Asp Val Ser Leu Glu Val Ser Gln Gly
            100                 105                 110

Pro Gly Leu Leu Asn Asp Thr Lys Val Tyr Thr Val Asp Leu Gly Arg
        115                 120                 125

Thr Val Thr Ile Asn Cys Pro Phe Lys Thr Glu Asn Ala Gln Lys Arg
    130                 135                 140

Lys Ser Leu Tyr Lys Gln Ile Gly Leu Tyr Pro Val Leu Val Ile Asp
145                 150                 155                 160

Ser Ser Gly Tyr Val Asn Pro Asn Tyr Thr Gly Arg Ile Arg Leu Asp
            165                 170                 175

Ile Gln Gly Thr Gly Gln Leu Leu Phe Ser Val Val Ile Asn Gln Leu
        180                 185                 190
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Arg Leu Ser Asp Ala Gly Gln Tyr Leu Cys Gln Ala Gly Asp Asp Ser
        195                 200                 205

Asn Ser Asn Lys Lys Asn Ala Asp Leu Gln Val Leu Lys Pro Glu Pro
    210                 215                 220

Glu Leu Val Tyr Glu Asp Leu Arg Gly Ser Val Thr Phe His Cys Ala
225                 230                 235                 240

Leu Gly Pro Glu Val Ala Asn Val Ala Lys Phe Leu Cys Arg Gln Ser
            245                 250                 255

Ser Gly Glu Asn Cys Asp Val Val Val Asn Thr Leu Gly Lys Arg Ala
            260                 265                 270

Pro Ala Phe Glu Gly Arg Ile Leu Leu Asn Pro Gln Asp Lys Asp Gly
        275                 280                 285

Ser Phe Ser Val Val Ile Thr Gly Leu Arg Lys Glu Asp Ala Gly Arg
    290                 295                 300

Tyr Leu Cys Gly Ala His Ser Asp Gly Gln Leu Gln Glu Gly Ser Pro
305                 310                 315                 320

Ile Gln Ala Trp Gln Leu Phe Val Asn Glu Glu Ser Thr Ile Pro Arg
            325                 330                 335

Ser Pro Thr Val Val Lys Gly Val Ala Gly Ser Ser Val Ala Val Leu
            340                 345                 350

Cys Pro Tyr Asn Arg Lys Glu Ser Lys Ser Ile Lys Tyr Trp Cys Leu
        355                 360                 365

Trp Glu Gly Ala Gln Asn Gly Arg Cys Pro Leu Leu Val Asp Ser Glu
    370                 375                 380

Gly Trp Val Lys Ala Gln Tyr Glu Gly Arg Leu Ser Leu Leu Glu Glu
385                 390                 395                 400

Pro Gly Asn Gly Thr Phe Thr Val Ile Leu Asn Gln Leu Thr Ser Arg
            405                 410                 415

Asp Ala Gly Phe Tyr Trp Cys Leu Thr Asn Gly Asp Thr Leu Trp Arg
            420                 425                 430

Thr Thr Val Glu Ile Lys Ile Ile Glu Gly Glu Pro Asn Leu Lys Val
        435                 440                 445

Pro Gly Asn Val Thr Ala Val Leu Gly Glu Thr Leu Lys Val Pro Cys
    450                 455                 460

His Phe Pro Cys Lys Phe Ser Ser Tyr Glu Lys Tyr Trp Cys Lys Trp
465                 470                 475                 480

Asn Asn Thr Gly Cys Gln Ala Leu Pro Ser Gln Asp Glu Gly Pro Ser
            485                 490                 495
```

Lys Ala Phe Val Asn Cys Asp Glu Asn Ser Arg Leu Val Ser Leu Thr
            500   505   510

Leu Asn Leu Val Thr Arg Ala Asp Glu Gly Trp Tyr Trp Cys Gly Val
            515   520   525

Lys Gln Gly His Phe Tyr Gly Glu Thr Ala Ala Val Tyr Val Ala Val
        530   535   540

Glu Glu Arg Lys Ala Ala Gly Ser Arg Asp Val Ser Leu Ala Lys Ala
545   550   555   560

Asp Ala Ala Pro Asp Glu Lys Val Leu Asp Ser Gly Phe Arg Glu Ile
                565   570   575

Glu Asn Lys Ala Ile Gln Asp Pro Arg Leu Phe Ala Glu Glu Lys Ala
            580   585   590

Val Ala Asp Thr Arg Asp Gln Ala Asp Gly Ser Arg Ala Ser Val Asp
            595   600   605

Ser Gly Ser Ser Glu Glu Gln Gly Gly Ser Ser Arg Ala Leu Val Ser
    610   615   620

Thr Leu Val Pro Leu Gly Leu Val Leu Ala Val Gly Ala Val Ala Val
625   630   635   640

Gly Val Ala Arg Ala Arg His Arg Lys Asn Val Asp Arg Val Ser Ile
                645   650   655

Arg Ser Tyr Arg Thr Asp Ile Ser Met Ser Asp Phe Glu Asn Ser Arg
            660   665   670

Glu Phe Gly Ala Asn Asp Asn Met Gly Ala Ser Ser Ile Thr Gln Glu
        675   680   685

Thr Ser Leu Gly Gly Lys Glu Glu Phe Val Ala Thr Thr Glu Ser Thr
    690   695   700

Thr Glu Thr Lys Glu Pro Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu
705   710   715   720

Ala Glu Met Ala Tyr Lys Asp Phe Leu Leu Gln Ser Ser Thr Val Ala
            725   730   735

Ala Glu Ala Gln Asp Gly Pro Gln Glu Ala
            740   745

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gtgctcccaa agctgacggg ataggaggaa ggagctcaaa caaccacaca ggacggtggc 120

tggcggcaga gacccgcggg agcccccagc g atg tcg cgc ctg ttc ctc gcc   172
                                              Met Ser Arg Leu Phe Leu Ala
                                              1   5

tgc ctg ctg gcc atc ttc cca gtg gtc tcc atg aag agt ccc atc ttc   220
Cys Leu Leu Ala Ile Phe Pro Val Val Ser Met Lys Ser Pro Ile Phe
      10   15   20

ggt ccc gag gag gtg agc agc gtg gaa ggc cgc tca gtg tcc atc aag   268
Gly Pro Glu Glu Val Ser Ser Val Glu Gly Arg Ser Val Ser Ile Lys
      25   30   35

tgc tac tac ccg ccc acc tcc gtc aac cgg cac acg cgc aag tac tgg   316
Cys Tyr Tyr Pro Pro Thr Ser Val Asn Arg His Thr Arg Lys Tyr Trp
  40   45   50   55

tgc cgg cag gga gcc cag ggc cgc tgc acg acc ctc atc tcc tcg gag   364
Cys Arg Gln Gly Ala Gln Gly Arg Cys Thr Thr Leu Ile Ser Ser Glu
                  60   65   70

ggc tac gtc tcc gac gac tac gtg ggc aga gcc aac ctc acc aac ttc   412
Gly Tyr Val Ser Asp Asp Tyr Val Gly Arg Ala Asn Leu Thr Asn Phe
              75   80   85

ccg gag agc ggc acg ttt gtg gtg gac atc agc cat ctc acc cat aaa   460
Pro Glu Ser Gly Thr Phe Val Val Asp Ile Ser His Leu Thr His Lys
              90   95   100

gac tca ggg cgc tac aag tgt ggc ctg ggc att agc agc cgt ggc ctt   508
Asp Ser Gly Arg Tyr Lys Cys Gly Leu Gly Ile Ser Ser Arg Gly Leu
      105   110   115

aac ttc gat gtg agc ctg gag gtc agc caa gat cct gca cag gca agt   556
Asn Phe Asp Val Ser Leu Glu Val Ser Gln Asp Pro Ala Gln Ala Ser
120   125   130   135

cat gcc cac gtc tac act ata gac ctg ggc agg act gtg acc atc aac   604
His Ala His Val Tyr Thr Ile Asp Leu Gly Arg Thr Val Thr Ile Asn
              140   145   150

tgc cct ttc acg cgt gcg aat tct gag aag aga aaa tcc ttg tgc aag   652
Cys Pro Phe Thr Arg Ala Asn Ser Glu Lys Arg Lys Ser Leu Cys Lys
              155   160   165

aag aca atc cag gac tgt ttc caa gtt gtc gac tcc acc ggg tat gtg   700
Lys Thr Ile Gln Asp Cys Phe Gln Val Val Asp Ser Thr Gly Tyr Val
              170   175   180

agc aac agc tat aaa gac aga gca cat atc agt atc cta ggt acc aac   748
Ser Asn Ser Tyr Lys Asp Arg Ala His Ile Ser Ile Leu Gly Thr Asn
      185   190   195

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aca tta gtg ttc agc gtt gtc atc aac cga gtc aag ctc agt gat gct    796
Thr Leu Val Phe Ser Val Val Ile Asn Arg Val Lys Leu Ser Asp Ala
200             205             210             215

ggg atg tat gtc tgc cag gct ggg gac gat gcc aaa gcc gat aaa atc    844
Gly Met Tyr Val Cys Gln Ala Gly Asp Asp Ala Lys Ala Asp Lys Ile
                220             225             230

aac att gac ctc cag gtg ctg gag cct gag cct gag ctg gtt tat gga    892
Asn Ile Asp Leu Gln Val Leu Glu Pro Glu Pro Glu Leu Val Tyr Gly
            235             240             245

gac ttg agg agc tcg gtg acc ttt gac tgt tcc ctg ggc ccc gag gtg    940
Asp Leu Arg Ser Ser Val Thr Phe Asp Cys Ser Leu Gly Pro Glu Val
        250             255             260

gca aat gtg ccc aaa ttt ctg tgc cag aag aag aat ggg gga gct tgc    988
Ala Asn Val Pro Lys Phe Leu Cys Gln Lys Lys Asn Gly Gly Ala Cys
        265             270             275

aat gta gtc atc aac acg ttg ggg aag aag gct cag gac ttc cag ggc    1036
Asn Val Val Ile Asn Thr Leu Gly Lys Lys Ala Gln Asp Phe Gln Gly
280             285             290             295

agg atc gtg tcc gtg ccc aag gac aat ggt gtc ttc agt gtg cac att    1084
Arg Ile Val Ser Val Pro Lys Asp Asn Gly Val Phe Ser Val His Ile
            300             305             310

acc agc ctg agg aaa gag gac gca ggg cgc tac gtg tgc ggg gcc cag    1132
Thr Ser Leu Arg Lys Glu Asp Ala Gly Arg Tyr Val Cys Gly Ala Gln
            315             320             325

cct gag ggt gag ccc cag gac ggc tgg cct gtg cag gcc tgg caa ctc    1180
Pro Glu Gly Glu Pro Gln Asp Gly Trp Pro Val Gln Ala Trp Gln Leu
            330             335             340

ttc gtc aat gaa gag acg gca atc ccc gca agc ccc tcc gtg gtg aaa    1228
Phe Val Asn Glu Glu Thr Ala Ile Pro Ala Ser Pro Ser Val Val Lys
        345             350             355

ggt gtg agg gga ggc tct gtg act gta tct tgc ccc tac aac cct aag    1276
Gly Val Arg Gly Gly Ser Val Thr Val Ser Cys Pro Tyr Asn Pro Lys
360             365             370             375

gat gcc aac agc gcg aag tac tgg tgt cac tgg gaa gag gct caa aac    1324
Asp Ala Asn Ser Ala Lys Tyr Trp Cys His Trp Glu Glu Ala Gln Asn
            380             385             390

ggc cgc tgc ccg cgg ctg gtg gag agc cgg ggg ctg atg aag gag cag    1372
Gly Arg Cys Pro Arg Leu Val Glu Ser Arg Gly Leu Met Lys Glu Gln
            395             400             405

tac gag ggc agg ctg gtg ctg ctc acc gag ccg ggc aac ggc acc tac    1420
Tyr Glu Gly Arg Leu Val Leu Leu Thr Glu Pro Gly Asn Gly Thr Tyr
        410             415             420
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acc gtc atc ctc aac cag ctc acc gat cag gac gcc ggc ttc tac tgg   1468
Thr Val Ile Leu Asn Gln Leu Thr Asp Gln Asp Ala Gly Phe Tyr Trp
    425                 430                 435

tgc gtg acc gac ggc gac acg cgc tgg atc tcc aca gtg gag ctc aag   1516
Cys Val Thr Asp Gly Asp Thr Arg Trp Ile Ser Thr Val Glu Leu Lys
440                 445                 450                     455

gtt gtc caa gga gaa cca agc ctc aag gta ccc aag aac gtc acg gct   1564
Val Val Gln Gly Glu Pro Ser Leu Lys Val Pro Lys Asn Val Thr Ala
                460                 465                 470

tgg ctg gga gag ccc tta aag ctc tcc tgc cac ttc ccc tgc aaa ttc   1612
Trp Leu Gly Glu Pro Leu Lys Leu Ser Cys His Phe Pro Cys Lys Phe
            475                 480                 485

tac tcc ttt gag aag tac tgg tgt aag tgg agc aac aga ggc tgc agc   1660
Tyr Ser Phe Glu Lys Tyr Trp Cys Lys Trp Ser Asn Arg Gly Cys Ser
        490                 495                 500

gcc ctg ccc acc cag aac gac ggc ccc agc cag gcc ttt gtg agc tgc   1708
Ala Leu Pro Thr Gln Asn Asp Gly Pro Ser Gln Ala Phe Val Ser Cys
    505                 510                 515

gac cag aac agc cag gtc gtc tcc ctg aac ctg gac aca gtc acc aag   1756
Asp Gln Asn Ser Gln Val Val Ser Leu Asn Leu Asp Thr Val Thr Lys
520                 525                 530                     535

gag gat gaa ggc tgg tac tgg tgt gga gtg aag gaa ggc ccc cga tac   1804
Glu Asp Glu Gly Trp Tyr Trp Cys Gly Val Lys Glu Gly Pro Arg Tyr
                540                 545                 550

ggg gag acg gcg gct gtc tac gtg gca gtg gag agc agg gtg aag ggg   1852
Gly Glu Thr Ala Ala Val Tyr Val Ala Val Glu Ser Arg Val Lys Gly
            555                 560                 565

tcc caa ggc gcc aag caa gtg aaa gct gcc cct gcg ggg gcg gca ata   1900
Ser Gln Gly Ala Lys Gln Val Lys Ala Ala Pro Ala Gly Ala Ala Ile
        570                 575                 580

cag tcg agg gcc ggg gag atc cag aac aaa gcc ctt ctg gac ccc agc   1948
Gln Ser Arg Ala Gly Glu Ile Gln Asn Lys Ala Leu Leu Asp Pro Ser
    585                 590                 595

ttt ttc gca aag gaa agt gtg aag gac gct gct ggt gga ccc gga gca   1996
Phe Phe Ala Lys Glu Ser Val Lys Asp Ala Ala Gly Gly Pro Gly Ala
600                 605                 610                     615

cct gca gat cct ggc cgc cct aca gga tac agc ggg agc tcc aaa gca   2044
Pro Ala Asp Pro Gly Arg Pro Thr Gly Tyr Ser Gly Ser Ser Lys Ala
                620                 625                 630

ctg gtc tcc acc ctg gtg ccc ctg gcc ctg gtc ctg gtc gca ggg gtc   2092
Leu Val Ser Thr Leu Val Pro Leu Ala Leu Val Leu Val Ala Gly Val
                635                 640                 645
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gtg gcg atc ggg gtg gtc cga gcc cgg cac agg aag aac gtc gac cgg   2140
Val Ala Ile Gly Val Val Arg Ala Arg His Arg Lys Asn Val Asp Arg
        650             655             660

att tca atc agg agc tac cgg aca gat atc agc atg tca gac ttt gag   2188
Ile Ser Ile Arg Ser Tyr Arg Thr Asp Ile Ser Met Ser Asp Phe Glu
        665             670             675

aac tcc agg gat ttt gaa gga cgt gac aac atg gga gcc tct cca gag   2236
Asn Ser Arg Asp Phe Glu Gly Arg Asp Asn Met Gly Ala Ser Pro Glu
680             685             690             695

gcc caa gag acg tct ctc gga ggg aag gac gag ttt gcc acc act acc   2284
Ala Gln Glu Thr Ser Leu Gly Gly Lys Asp Glu Phe Ala Thr Thr Thr
                700             705             710

gag gac acc gtg gag agc aaa gaa ccc aag aag gca aag agg tcg tcc   2332
Glu Asp Thr Val Glu Ser Lys Glu Pro Lys Lys Ala Lys Arg Ser Ser
                715             720             725

aag gag gaa gcc gac gag gcc ttc acc acc ttc ctc ctc cag gcc aaa   2380
Lys Glu Glu Ala Asp Glu Ala Phe Thr Thr Phe Leu Leu Gln Ala Lys
                730             735             740

aac ctg gcc tcc gcc gca acc cag aac ggc ccg aca gaa gcc tag       2425
Asn Leu Ala Ser Ala Ala Thr Gln Asn Gly Pro Thr Glu Ala .
    745             750             755

acggagccct gggcgcccct tccctccgca cgtggcaatc acgctccgaa tcacgctgat   2485

cctcagggcc ctcagctcgg ggggctccac tgcctgcact cacacccgc ctaggcttct   2545

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tgttcctatt gggggtgagg tggtacgagg agttcccacc tgcagcttat tcgaacgaga   2665

gaactaaagg tgtggaggag aattaagatc gcagaggggc ctctcagaaa gaaaaggagt   2725

gggtggggag acaaccgcag aaagggggcc attcagcgct tccctgtccc cttatttggg   2785

gatgtcagtg gaatcctccc ttccacccca tctctgcacc tctccatccc cactccattc   2845

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atcaaggagc ccctggagcc cacagcatct cttcacgtgt acactcactg acctctgcct   3025

ctgctgggag aaatcataaa gggtctgcag ccctgaggcc ttagggatta tgtaacacag   3085

gcatacacac aaggcaccat caacacattc ttaccatttc acaggtgaga aagccgaggt   3145

cctgagaggt ggagaggttt gctcagagtc agcaagtgag atgtacgagt ctcaagctaa   3205

agatttgaca cctgctgtcc ctacaggagg gcctcctctc tccagatgag acagcattcc   3265

ataggaagga gaagaaaaat gtaaataaga ctggtctttc acaggcccca catcagggaa   3325
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gatacccctt tccctgtctg tcactcacag agacctaata ggataagaga atggtcaaca 3385

ctcaaacccc cgaatgtgaa gagttctaag tggaaaggga ggaaaaaggg gggatttgat 3445

ggtgccaggg aggggctgat ctccaaagaa ctaaggttta agtttttttg tttttttttt 3505

tccttcttct aagctctgca cttcaactag catctatgag ctggcacttg ctaacaaatc 3565

aaaaatgtga attaattaat aattaaagac catgatttcc tccaaaaaaa aaaaaaaaaa 3625

aaaaa   3630

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                20   25   30

Gly Arg Ser Val Ser Ile Lys Cys Tyr Tyr Pro Pro Thr Ser Val Asn
            35   40   45

Arg His Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala Gln Gly Arg Cys
        50   55   60

Thr Thr Leu Ile Ser Ser Glu Gly Tyr Val Ser Asp Asp Tyr Val Gly
 65   70   75   80

Arg Ala Asn Leu Thr Asn Phe Pro Glu Ser Gly Thr Phe Val Val Asp
                85   90   95

Ile Ser His Leu Thr His Lys Asp Ser Gly Arg Tyr Lys Cys Gly Leu
            100   105   110

Gly Ile Ser Ser Arg Gly Leu Asn Phe Asp Val Ser Leu Glu Val Ser
            115   120   125

Gln Asp Pro Ala Gln Ala Ser His Ala His Val Tyr Thr Ile Asp Leu
        130   135   140

Gly Arg Thr Val Thr Ile Asn Cys Pro Phe Thr Arg Ala Asn Ser Glu
145   150   155   160

Lys Arg Lys Ser Leu Cys Lys Lys Thr Ile Gln Asp Cys Phe Gln Val
                165   170   175

Val Asp Ser Thr Gly Tyr Val Ser Asn Ser Tyr Lys Asp Arg Ala His
            180   185   190

Ile Ser Ile Leu Gly Thr Asn Thr Leu Val Phe Ser Val Val Ile Asn
            195   200   205

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Arg Val Lys Leu Ser Asp Ala Gly Met Tyr Val Cys Gln Ala Gly Asp
    210             215             220

Asp Ala Lys Ala Asp Lys Ile Asn Ile Asp Leu Gln Val Leu Glu Pro
225             230             235             240

Glu Pro Glu Leu Val Tyr Gly Asp Leu Arg Ser Ser Val Thr Phe Asp
            245             250             255

Cys Ser Leu Gly Pro Glu Val Ala Asn Val Pro Lys Phe Leu Cys Gln
            260             265             270

Lys Lys Asn Gly Gly Ala Cys Asn Val Val Ile Asn Thr Leu Gly Lys
    275             280             285

Lys Ala Gln Asp Phe Gln Gly Arg Ile Val Ser Val Pro Lys Asp Asn
    290             295             300

Gly Val Phe Ser Val His Ile Thr Ser Leu Arg Lys Glu Asp Ala Gly
305             310             315             320

Arg Tyr Val Cys Gly Ala Gln Pro Glu Gly Glu Pro Gln Asp Gly Trp
            325             330             335

Pro Val Gln Ala Trp Gln Leu Phe Val Asn Glu Glu Thr Ala Ile Pro
            340             345             350

Ala Ser Pro Ser Val Val Lys Gly Val Arg Gly Gly Ser Val Thr Val
            355             360             365

Ser Cys Pro Tyr Asn Pro Lys Asp Ala Asn Ser Ala Lys Tyr Trp Cys
    370             375             380

His Trp Glu Glu Ala Gln Asn Gly Arg Cys Pro Arg Leu Val Glu Ser
385             390             395             400

Arg Gly Leu Met Lys Glu Gln Tyr Glu Gly Arg Leu Val Leu Leu Thr
            405             410             415

Glu Pro Gly Asn Gly Thr Tyr Thr Val Ile Leu Asn Gln Leu Thr Asp
            420             425             430

Gln Asp Ala Gly Phe Tyr Trp Cys Val Thr Asp Gly Asp Thr Arg Trp
    435             440             445

Ile Ser Thr Val Glu Leu Lys Val Val Gln Gly Glu Pro Ser Leu Lys
    450             455             460

Val Pro Lys Asn Val Thr Ala Trp Leu Gly Glu Pro Leu Lys Leu Ser
465             470             475             480

Cys His Phe Pro Cys Lys Phe Tyr Ser Phe Glu Lys Tyr Trp Cys Lys
            485             490             495

Trp Ser Asn Arg Gly Cys Ser Ala Leu Pro Thr Gln Asn Asp Gly Pro
            500             505             510
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Ser Gln Ala Phe Val Ser Cys Asp Gln Asn Ser Gln Val Val Ser Leu
        515             520             525

Asn Leu Asp Thr Val Thr Lys Glu Asp Glu Gly Trp Tyr Trp Cys Gly
        530             535             540

Val Lys Glu Gly Pro Arg Tyr Gly Glu Thr Ala Ala Val Tyr Val Ala
545             550             555             560

Val Glu Ser Arg Val Lys Gly Ser Gln Gly Ala Lys Gln Val Lys Ala
                565             570             575

Ala Pro Ala Gly Ala Ala Ile Gln Ser Arg Ala Gly Glu Ile Gln Asn
            580             585             590

Lys Ala Leu Leu Asp Pro Ser Phe Phe Ala Lys Glu Ser Val Lys Asp
        595             600             605

Ala Ala Gly Gly Pro Gly Ala Pro Ala Asp Pro Gly Arg Pro Thr Gly
    610             615             620

Tyr Ser Gly Ser Ser Lys Ala Leu Val Ser Thr Leu Val Pro Leu Ala
625             630             635             640

Leu Val Leu Val Ala Gly Val Val Ala Ile Gly Val Val Arg Ala Arg
                645             650             655

His Arg Lys Asn Val Asp Arg Ile Ser Ile Arg Ser Tyr Arg Thr Asp
            660             665             670

Ile Ser Met Ser Asp Phe Glu Asn Ser Arg Asp Phe Glu Gly Arg Asp
        675             680             685

Asn Met Gly Ala Ser Pro Glu Ala Gln Glu Thr Ser Leu Gly Gly Lys
    690             695             700

Asp Glu Phe Ala Thr Thr Thr Glu Asp Thr Val Glu Ser Lys Glu Pro
705             710             715             720

Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala Asp Glu Ala Phe Thr
            725             730             735

Thr Phe Leu Leu Gln Ala Lys Asn Leu Ala Ser Ala Ala Thr Gln Asn
            740             745             750

Gly Pro Thr Glu Ala
        755
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                           Met Arg Leu Tyr Leu Phe Thr Leu Leu
                            1   5

gta act gtc ttt tca ggg gtc tcc aca aaa agc ccc ata ttt ggt ccc   159
Val Thr Val Phe Ser Gly Val Ser Thr Lys Ser Pro Ile Phe Gly Pro
 10   15   20   25

cag gag gtg agt agt ata gaa ggc gac tct gtt tcc atc acg tgc tac   207
Gln Glu Val Ser Ser Ile Glu Gly Asp Ser Val Ser Ile Thr Cys Tyr
                30   35   40

tac cca gac acc tct gtc aac cgg cac acc cgg aaa tac tgg tgc cga   255
Tyr Pro Asp Thr Ser Val Asn Arg His Thr Arg Lys Tyr Trp Cys Arg
                45   50   55

caa gga gcc agc ggc atg tgc aca acg ctc atc tct tca aat ggc tac   303
Gln Gly Ala Ser Gly Met Cys Thr Thr Leu Ile Ser Ser Asn Gly Tyr
            60   65   70

ctc tcc aag gag tat tca ggc aga gcc aac ctc atc aac ttc cca gag   351
Leu Ser Lys Glu Tyr Ser Gly Arg Ala Asn Leu Ile Asn Phe Pro Glu
        75   80   85

aac aac aca ttt gtg att aac att gag cag ctc acc cag gac gac act   399
Asn Asn Thr Phe Val Ile Asn Ile Glu Gln Leu Thr Gln Asp Asp Thr
 90   95   100   105

ggg agc tac aag tgt ggc ctg ggt acc agt aac cga ggc ctg tcc ttc   447
Gly Ser Tyr Lys Cys Gly Leu Gly Thr Ser Asn Arg Gly Leu Ser Phe
                110   115   120

gat gtc agc ctg gag gtc agc cag gtt cct gag ttg ccg agt gac acc   495
Asp Val Ser Leu Glu Val Ser Gln Val Pro Glu Leu Pro Ser Asp Thr
            125   130   135

cac gtc tac aca aag gac ata ggc aga aat gtg acc att gaa tgc cct   543
His Val Tyr Thr Lys Asp Ile Gly Arg Asn Val Thr Ile Glu Cys Pro
            140   145   150

ttc aaa agg gag aat gtt ccc agc aag aaa tcc ctg tgt aag aag aca   591
Phe Lys Arg Glu Asn Val Pro Ser Lys Lys Ser Leu Cys Lys Lys Thr
        155   160   165

aac cag tcc tgc gaa ctt gtc att gac tct act gag aag gtg aac ccc   639
Asn Gln Ser Cys Glu Leu Val Ile Asp Ser Thr Glu Lys Val Asn Pro
170   175   180   185

agc tat ata ggc aga gca aaa ctt ttt atg aaa ggg acc gac cta act   687
Ser Tyr Ile Gly Arg Ala Lys Leu Phe Met Lys Gly Thr Asp Leu Thr
                190   195   200

gta ttc tat gtc aac att agt cac cta acg cac aat gat gct ggg ctg   735
Val Phe Tyr Val Asn Ile Ser His Leu Thr His Asn Asp Ala Gly Leu
                205   210   215

```
tac atc tgc caa gct gga gaa ggt cct agt gct gat aag aag aat gtt    783
Tyr Ile Cys Gln Ala Gly Glu Gly Pro Ser Ala Asp Lys Lys Asn Val
        220             225             230

gac ctc cag gtg cta gcg cct gag cca gag ctg ctt tat aaa gac ctg    831
Asp Leu Gln Val Leu Ala Pro Glu Pro Glu Leu Leu Tyr Lys Asp Leu
        235             240             245

agg tcc tca gtg act ttt gaa tgt gac ctg ggc cgt gag gtg gca aac    879
Arg Ser Ser Val Thr Phe Glu Cys Asp Leu Gly Arg Glu Val Ala Asn
250             255             260             265

gag gcc aaa tat ctg tgc cgg atg aat aag gaa acc tgt gat gtg atc    927
Glu Ala Lys Tyr Leu Cys Arg Met Asn Lys Glu Thr Cys Asp Val Ile
                270             275             280

att aac acc ctg ggg aag agg gat cca gac ttt gag ggc agg atc ctg    975
Ile Asn Thr Leu Gly Lys Arg Asp Pro Asp Phe Glu Gly Arg Ile Leu
            285             290             295

ata acc ccc aag gat gac aat ggc cgc ttc agt gtg ttg atc aca ggc   1023
Ile Thr Pro Lys Asp Asp Asn Gly Arg Phe Ser Val Leu Ile Thr Gly
        300             305             310

ctg agg aag gag gat gca ggg cac tac cag tgt gga gcc cac agt tct   1071
Leu Arg Lys Glu Asp Ala Gly His Tyr Gln Cys Gly Ala His Ser Ser
        315             320             325

ggt ttg cct caa gaa ggc tgg ccc atc cag act tgg caa ctc ttt gtc   1119
Gly Leu Pro Gln Glu Gly Trp Pro Ile Gln Thr Trp Gln Leu Phe Val
330             335             340             345

aat gaa gag tct acc att ccc aat cgt cgc tct gtt gtg aag gga gtc   1167
Asn Glu Glu Ser Thr Ile Pro Asn Arg Arg Ser Val Val Lys Gly Val
            350             355             360

aca gga ggc tct gtg gcc atc gcc tgt ccc tat aac ccc aag gaa agc   1215
Thr Gly Gly Ser Val Ala Ile Ala Cys Pro Tyr Asn Pro Lys Glu Ser
            365             370             375

agc agc ctc aag tac tgg tgt cgc tgg gaa ggg gac gga aat gga cat   1263
Ser Ser Leu Lys Tyr Trp Cys Arg Trp Glu Gly Asp Gly Asn Gly His
            380             385             390

tgc ccc gcg ctt gtg ggg acc cag gcc cag gtg caa gaa gag tat gaa   1311
Cys Pro Ala Leu Val Gly Thr Gln Ala Gln Val Gln Glu Glu Tyr Glu
        395             400             405

ggc cga ctg gca ctg ttt gat cag cca ggc aat ggt act tac act gtc   1359
Gly Arg Leu Ala Leu Phe Asp Gln Pro Gly Asn Gly Thr Tyr Thr Val
410             415             420             425

atc ctc aac cag ctc acc acc gag gat gct ggc ttc tat tgg tgt ctt   1407
Ile Leu Asn Gln Leu Thr Thr Glu Asp Ala Gly Phe Tyr Trp Cys Leu
            430             435             440
```

```
acc aat ggt gac tct cgc tgg aga acc aca ata gaa ctc cag gtt gcc    1455
Thr Asn Gly Asp Ser Arg Trp Arg Thr Thr Ile Glu Leu Gln Val Ala
            445                 450                 455

gaa gct aca agg gag cca aac ctt gag gtg acg cca cag aac gca aca    1503
Glu Ala Thr Arg Glu Pro Asn Leu Glu Val Thr Pro Gln Asn Ala Thr
            460                 465                 470

gca gta cta gga gag acc ttc acc gtt tcc tgc cac tat ccg tgc aaa    1551
Ala Val Leu Gly Glu Thr Phe Thr Val Ser Cys His Tyr Pro Cys Lys
            475                 480                 485

ttc tac tcc cag gag aaa tac tgg tgc aag tgg agc aac aag ggt tgc    1599
Phe Tyr Ser Gln Glu Lys Tyr Trp Cys Lys Trp Ser Asn Lys Gly Cys
490                 495                 500                 505

cac atc ctg cca agc cat gac gaa ggt gcc cgc caa tct tct gtg agc    1647
His Ile Leu Pro Ser His Asp Glu Gly Ala Arg Gln Ser Ser Val Ser
                510                 515                 520

tgc gac cag agc agc cag ctg gtc tcc atg acc ctg aac ccg gtc agt    1695
Cys Asp Gln Ser Ser Gln Leu Val Ser Met Thr Leu Asn Pro Val Ser
            525                 530                 535

aag gaa gat gaa ggc tgg tac tgg tgt ggg gta aag caa ggc cag acc    1743
Lys Glu Asp Glu Gly Trp Tyr Trp Cys Gly Val Lys Gln Gly Gln Thr
            540                 545                 550

tat gga gaa act acc gcc atc tat ata gca gtt gaa gag agg acc aga    1791
Tyr Gly Glu Thr Thr Ala Ile Tyr Ile Ala Val Glu Glu Arg Thr Arg
            555                 560                 565

ggg tca tcc cat gtc aac cca aca gat gca aat gca cgt gcc aaa gtc    1839
Gly Ser Ser His Val Asn Pro Thr Asp Ala Asn Ala Arg Ala Lys Val
570                 575                 580                 585

gct ctg gaa gaa gag gta gtg gac tcc tcc atc agt gaa aaa gag aac    1887
Ala Leu Glu Glu Glu Val Val Asp Ser Ser Ile Ser Glu Lys Glu Asn
                590                 595                 600

aaa gcc att cca aat ccc ggg cct ttt gcc aac gaa aga gag ata cag    1935
Lys Ala Ile Pro Asn Pro Gly Pro Phe Ala Asn Glu Arg Glu Ile Gln
                605                 610                 615

aat gtg aga gac caa gct cag gag aac aga gca tct ggg gat gct ggc    1983
Asn Val Arg Asp Gln Ala Gln Glu Asn Arg Ala Ser Gly Asp Ala Gly
            620                 625                 630

agt gct gat gga caa agc agg agc tcc agc tcc aaa gtg ctg ttc tcc    2031
Ser Ala Asp Gly Gln Ser Arg Ser Ser Ser Ser Lys Val Leu Phe Ser
            635                 640                 645

acc ctg gtg ccc ctg ggt ctg gtg ctg gca gtg ggt gct ata gct gtg    2079
Thr Leu Val Pro Leu Gly Leu Val Leu Ala Val Gly Ala Ile Ala Val
650                 655                 660                 665
```

```
tgg gtg gcc aga gtc cga cat cgg aag aat gta gac cgc atg tca atc   2127
Trp Val Ala Arg Val Arg His Arg Lys Asn Val Asp Arg Met Ser Ile
            670         675             680

agc agc tac agg aca gac att agc atg gca gac ttc aag aac tcc aga   2175
Ser Ser Tyr Arg Thr Asp Ile Ser Met Ala Asp Phe Lys Asn Ser Arg
            685         690             695

gat ttg gga ggc aat gac aac atg ggg gcc tct cca gac aca cag caa   2223
Asp Leu Gly Gly Asn Asp Asn Met Gly Ala Ser Pro Asp Thr Gln Gln
        700             705         710

aca gtc atc gaa gga aaa gat gaa atc gtg act acc acg gag tgc acc   2271
Thr Val Ile Glu Gly Lys Asp Glu Ile Val Thr Thr Thr Glu Cys Thr
        715             720         725

gct gag cca gaa gaa tcc aag aaa gca aaa agg tca tcc aag gag gaa   2319
Ala Glu Pro Glu Glu Ser Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu
730             735             740             745

gct gac atg gcc tac tcg gca ttc ctg ctt cag tcc agc acc ata gct   2367
Ala Asp Met Ala Tyr Ser Ala Phe Leu Leu Gln Ser Ser Thr Ile Ala
            750             755             760

gca cag gtc cac gat ggt ccc cag gaa gcc tag gcagtgctga ccacccaccc 2420
Ala Gln Val His Asp Gly Pro Gln Glu Ala
            765             770

ttgcctgtga caatcaactt gagaatcaca ctgatccgct cgcagcccac actcacccat 2480

cacctccgct cttccctcct gtcctcagag gtgtgctggt tccttcctcg gccatggaag 2540

cctggcctag ttacgcctgt ttaggagaga gtgtgaggcg ttcttttctc tatgaagaga 2600

gtgaggtgga aatgaggagg aggtgaacct gagagacatc tctggaggaa gagggttgag 2660

aataggggct cgtttcagga gaaaaggcca tttgaatctt ctttataacc atatgatagg 2720

atgtcagcgt aactcttctc tcctccatct ctcctttcct atcctcttga ttcaaacaac 2780

acatctgaga actcactagg cttcagtgcc tactaaatgc tgagagccag gccacaatct 2840

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aagggcatca tgattttcag atgagaagag atgtttctca agagtgccta gtgagataga 3020

ctagcgtcaa accagatgtg gcaactcctg gctcttggcc tacgatctgt cttcaagaaa 3080

aaaaaaaaaa aaaaa                                                  3095
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Ser Thr Lys Ser Pro Ile Phe Gly Pro Gln Glu Val Ser Ser Ile Glu
            20                  25                 30

Gly Asp Ser Val Ser Ile Thr Cys Tyr Tyr Pro Asp Thr Ser Val Asn
            35                  40                 45

Arg His Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala Ser Gly Met Cys
        50                  55                 60

Thr Thr Leu Ile Ser Ser Asn Gly Tyr Leu Ser Lys Glu Tyr Ser Gly
 65                 70                  75                 80

Arg Ala Asn Leu Ile Asn Phe Pro Glu Asn Asn Thr Phe Val Ile Asn
                85                  90                 95

Ile Glu Gln Leu Thr Gln Asp Asp Thr Gly Ser Tyr Lys Cys Gly Leu
            100                 105                110

Gly Thr Ser Asn Arg Gly Leu Ser Phe Asp Val Ser Leu Glu Val Ser
        115                 120                 125

Gln Val Pro Glu Leu Pro Ser Asp Thr His Val Tyr Thr Lys Asp Ile
    130                 135                 140

Gly Arg Asn Val Thr Ile Glu Cys Pro Phe Lys Arg Glu Asn Val Pro
145                 150                 155                160

Ser Lys Lys Ser Leu Cys Lys Lys Thr Asn Gln Ser Cys Glu Leu Val
            165                 170                 175

Ile Asp Ser Thr Glu Lys Val Asn Pro Ser Tyr Ile Gly Arg Ala Lys
            180                 185                 190

Leu Phe Met Lys Gly Thr Asp Leu Thr Val Phe Tyr Val Asn Ile Ser
        195                 200                 205

His Leu Thr His Asn Asp Ala Gly Leu Tyr Ile Cys Gln Ala Gly Glu
    210                 215                 220

Gly Pro Ser Ala Asp Lys Lys Asn Val Asp Leu Gln Val Leu Ala Pro
225                 230                 235                 240

Glu Pro Glu Leu Leu Tyr Lys Asp Leu Arg Ser Ser Val Thr Phe Glu
            245                 250                 255

Cys Asp Leu Gly Arg Glu Val Ala Asn Glu Ala Lys Tyr Leu Cys Arg
            260                 265                 270

Met Asn Lys Glu Thr Cys Asp Val Ile Ile Asn Thr Leu Gly Lys Arg
        275                 280                 285

Asp Pro Asp Phe Glu Gly Arg Ile Leu Ile Thr Pro Lys Asp Asp Asn
    290                 295                 300
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Gly Arg Phe Ser Val Leu Ile Thr Gly Leu Arg Lys Glu Asp Ala Gly
305             310             315             320

His Tyr Gln Cys Gly Ala His Ser Ser Gly Leu Pro Gln Glu Gly Trp
            325             330             335

Pro Ile Gln Thr Trp Gln Leu Phe Val Asn Glu Glu Ser Thr Ile Pro
            340             345             350

Asn Arg Arg Ser Val Val Lys Gly Val Thr Gly Gly Ser Val Ala Ile
        355             360             365

Ala Cys Pro Tyr Asn Pro Lys Glu Ser Ser Ser Leu Lys Tyr Trp Cys
    370             375             380

Arg Trp Glu Gly Asp Gly Asn Gly His Cys Pro Ala Leu Val Gly Thr
385             390             395             400

Gln Ala Gln Val Gln Glu Glu Tyr Glu Gly Arg Leu Ala Leu Phe Asp
            405             410             415

Gln Pro Gly Asn Gly Thr Tyr Thr Val Ile Leu Asn Gln Leu Thr Thr
            420             425             430

Glu Asp Ala Gly Phe Tyr Trp Cys Leu Thr Asn Gly Asp Ser Arg Trp
        435             440             445

Arg Thr Thr Ile Glu Leu Gln Val Ala Glu Ala Thr Arg Glu Pro Asn
450             455             460

Leu Glu Val Thr Pro Gln Asn Ala Thr Ala Val Leu Gly Glu Thr Phe
465             470             475             480

Thr Val Ser Cys His Tyr Pro Cys Lys Phe Tyr Ser Gln Glu Lys Tyr
            485             490             495

Trp Cys Lys Trp Ser Asn Lys Gly Cys His Ile Leu Pro Ser His Asp
        500             505             510

Glu Gly Ala Arg Gln Ser Ser Val Ser Cys Asp Gln Ser Ser Gln Leu
        515             520             525

Val Ser Met Thr Leu Asn Pro Val Ser Lys Glu Asp Glu Gly Trp Tyr
    530             535             540

Trp Cys Gly Val Lys Gln Gly Gln Thr Tyr Gly Glu Thr Thr Ala Ile
545             550             555             560

Tyr Ile Ala Val Glu Glu Arg Thr Arg Gly Ser Ser His Val Asn Pro
            565             570             575

Thr Asp Ala Asn Ala Arg Ala Lys Val Ala Leu Glu Glu Glu Val Val
            580             585             590

Asp Ser Ser Ile Ser Glu Lys Glu Asn Lys Ala Ile Pro Asn Pro Gly
        595             600             605
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Pro Phe Ala Asn Glu Arg Glu Ile Gln Asn Val Arg Asp Gln Ala Gln
    610             615             620

Glu Asn Arg Ala Ser Gly Asp Ala Gly Ser Ala Asp Gly Gln Ser Arg
625             630             635             640

Ser Ser Ser Ser Lys Val Leu Phe Ser Thr Leu Val Pro Leu Gly Leu
            645             650                 655

Val Leu Ala Val Gly Ala Ile Ala Val Trp Val Ala Arg Val Arg His
            660             665             670

Arg Lys Asn Val Asp Arg Met Ser Ile Ser Ser Tyr Arg Thr Asp Ile
    675             680             685

Ser Met Ala Asp Phe Lys Asn Ser Arg Asp Leu Gly Gly Asn Asp Asn
    690             695             700

Met Gly Ala Ser Pro Asp Thr Gln Gln Thr Val Ile Glu Gly Lys Asp
705             710             715             720

Glu Ile Val Thr Thr Thr Glu Cys Thr Ala Glu Pro Glu Glu Ser Lys
            725             730             735

Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala Asp Met Ala Tyr Ser Ala
            740             745             750

Phe Leu Leu Gln Ser Ser Thr Ile Ala Ala Gln Val His Asp Gly Pro
            755             760             765

Gln Glu Ala
    770
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gaagccacaa gcg atg agg ctc tcc ttg ttc gcc ctc ttg gta act gtc     109
            Met Arg Leu Ser Leu Phe Ala Leu Leu Val Thr Val
            1               5                   10

ttc tca ggg gtc tcc aca caa agc ccc ata ttt ggt ccc cag gat gtg   157
Phe Ser Gly Val Ser Thr Gln Ser Pro Ile Phe Gly Pro Gln Asp Val
        15                  20                  25

agt agt att gaa ggt aac tcg gtc tcc atc acg tgc tac tac cca gac   205
Ser Ser Ile Glu Gly Asn Ser Val Ser Ile Thr Cys Tyr Tyr Pro Asp
    30                  35                  40
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acc tct gtc aac cgg cac acc cgg aaa tac tgg tgc cga caa gga gcc   253
Thr Ser Val Asn Arg His Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala
45              50              55                  60

aac ggc tac tgc gca acc ctc atc tct tca aat ggc tac ctc tcg aag   301
Asn Gly Tyr Cys Ala Thr Leu Ile Ser Ser Asn Gly Tyr Leu Ser Lys
                65              70                  75

gag tat tca ggc aga gcc agc ctc atc aac ttc cca gag aat agc aca   349
Glu Tyr Ser Gly Arg Ala Ser Leu Ile Asn Phe Pro Glu Asn Ser Thr
            80              85                  90

ttt gtg att aac att gca cat ctc acc cag gag gac act ggg agc tac   397
Phe Val Ile Asn Ile Ala His Leu Thr Gln Glu Asp Thr Gly Ser Tyr
        95              100                 105

aag tgt ggt ctg ggt acc act aac cga ggc ctg ttt ttc gat gtc agc   445
Lys Cys Gly Leu Gly Thr Thr Asn Arg Gly Leu Phe Phe Asp Val Ser
    110             115                 120

ctg gag gtc agc cag gtt cct gag ttc cca aat gac acc cat gtc tac   493
Leu Glu Val Ser Gln Val Pro Glu Phe Pro Asn Asp Thr His Val Tyr
125             130                 135                 140

aca aag gac ata ggc aga act gtg acc atc gaa tgc cgt ttc aaa gag   541
Thr Lys Asp Ile Gly Arg Thr Val Thr Ile Glu Cys Arg Phe Lys Glu
            145             150                 155

ggg aat gct cat agc aag aaa tcc ctg tgt aag aag aga gga gag gcc   589
Gly Asn Ala His Ser Lys Lys Ser Leu Cys Lys Lys Arg Gly Glu Ala
            160             165                 170

tgc gaa gtt gtc atc gac tct act gag tac gtg gac ccc agc tat aag   637
Cys Glu Val Val Ile Asp Ser Thr Glu Tyr Val Asp Pro Ser Tyr Lys
    175             180                 185

gac aga gca atc ctt ttt atg aaa ggg acc agc cgc gat ata ttc tat   685
Asp Arg Ala Ile Leu Phe Met Lys Gly Thr Ser Arg Asp Ile Phe Tyr
    190             195                 200

gtc aac att agc cac cta ata ccc agt gat gct gga ctg tat gtt tgc   733
Val Asn Ile Ser His Leu Ile Pro Ser Asp Ala Gly Leu Tyr Val Cys
205             210                 215                 220

caa gct gga gaa ggc ccc agt gct gat aaa aat aat gct gac ctc cag   781
Gln Ala Gly Glu Gly Pro Ser Ala Asp Lys Asn Asn Ala Asp Leu Gln
            225             230                 235

gtg cta gag cct gag cca gag ctg ctt tat aaa gac ctg agg tcc tca   829
Val Leu Glu Pro Glu Pro Glu Leu Leu Tyr Lys Asp Leu Arg Ser Ser
            240             245                 250

gtg act ttt gaa tgt gac ctg ggc cgt gaa gtg gca aat gat gcc aaa   877
Val Thr Phe Glu Cys Asp Leu Gly Arg Glu Val Ala Asn Asp Ala Lys
            255             260                 265
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tat ctg tgt cgg aag aac aag gaa acc tgt gat gtc atc atc aac acc    925
Tyr Leu Cys Arg Lys Asn Lys Glu Thr Cys Asp Val Ile Ile Asn Thr
    270             275                 280

ctg ggg aag aga gat cca gcc ttt gaa ggc agg atc ctg cta acc ccc    973
Leu Gly Lys Arg Asp Pro Ala Phe Glu Gly Arg Ile Leu Leu Thr Pro
285                 290                 295                 300

agg gat gac aat ggc cgc ttc agt gtg ttg atc aca ggc ctg agg aag   1021
Arg Asp Asp Asn Gly Arg Phe Ser Val Leu Ile Thr Gly Leu Arg Lys
                305                 310                 315

gag gat gca ggg cac tac cag tgt gga gcg cac agt tct ggt ttg cct   1069
Glu Asp Ala Gly His Tyr Gln Cys Gly Ala His Ser Ser Gly Leu Pro
            320                 325                 330

caa gaa ggc tgg ccc gtc cag gct tgg caa ctc ttt gtc aat gaa gag   1117
Gln Glu Gly Trp Pro Val Gln Ala Trp Gln Leu Phe Val Asn Glu Glu
            335                 340                 345

tcc acg att ccc aat agt cgc tct gtt gtg aag ggt gtc aca gga ggc   1165
Ser Thr Ile Pro Asn Ser Arg Ser Val Val Lys Gly Val Thr Gly Gly
    350                 355                 360

tct gtg gcc atc gtc tgt ccc tat aac ccc aag gaa agc agc agc ctc   1213
Ser Val Ala Ile Val Cys Pro Tyr Asn Pro Lys Glu Ser Ser Ser Leu
365                 370                 375                 380

aag tac tgg tgt cac tgg gaa gcc gac gag aat gga cgc tgc ccg gtg   1261
Lys Tyr Trp Cys His Trp Glu Ala Asp Glu Asn Gly Arg Cys Pro Val
                385                 390                 395

ctc gtg ggg acc cag gcc ctg gtg caa gaa gga tat gaa ggc cga ctg   1309
Leu Val Gly Thr Gln Ala Leu Val Gln Glu Gly Tyr Glu Gly Arg Leu
                400                 405                 410

gca ctg ttc gat cag ccg ggc agt ggc gcc tac act gtc atc ctc aac   1357
Ala Leu Phe Asp Gln Pro Gly Ser Gly Ala Tyr Thr Val Ile Leu Asn
            415                 420                 425

cag ctc acc acc cag gat tct ggc ttc tac tgg tgt ctt acc gat ggt   1405
Gln Leu Thr Thr Gln Asp Ser Gly Phe Tyr Trp Cys Leu Thr Asp Gly
    430                 435                 440

gac tct cgc tgg aga acc acg ata gaa ctg cag gtt gct gaa gct aca   1453
Asp Ser Arg Trp Arg Thr Thr Ile Glu Leu Gln Val Ala Glu Ala Thr
445                 450                 455                 460

aag aag cca gac ctt gag gtg aca cca cag aac gcg acc gcg gtg ata   1501
Lys Lys Pro Asp Leu Glu Val Thr Pro Gln Asn Ala Thr Ala Val Ile
                465                 470                 475

gga gag acc ttc aca atc tcc tgc cac tat ccg tgc aaa ttc tac tcc   1549
Gly Glu Thr Phe Thr Ile Ser Cys His Tyr Pro Cys Lys Phe Tyr Ser
                480                 485                 490
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cag gag aaa tac tgg tgc aag tgg agc aac gac ggc tgc cac atc ctg    1597
Gln Glu Lys Tyr Trp Cys Lys Trp Ser Asn Asp Gly Cys His Ile Leu
        495             500             505

ccg agc cat gat gaa ggt gcc cgc cag tcc tct gtg agc tgt gac cag    1645
Pro Ser His Asp Glu Gly Ala Arg Gln Ser Ser Val Ser Cys Asp Gln
        510             515             520

agc agc cag atc gtc tcc atg acc ctg aac ccg gtc aaa aag gaa gat    1693
Ser Ser Gln Ile Val Ser Met Thr Leu Asn Pro Val Lys Lys Glu Asp
525             530             535             540

gaa ggc tgg tac tgg tgt ggg gta aaa gaa ggt cag gtc tat gga gaa    1741
Glu Gly Trp Tyr Trp Cys Gly Val Lys Glu Gly Gln Val Tyr Gly Glu
                545             550             555

act aca gcc atc tat gta gca gtt gaa gag agg acc aga ggg tca ccc    1789
Thr Thr Ala Ile Tyr Val Ala Val Glu Glu Arg Thr Arg Gly Ser Pro
                560             565             570

cac atc aac ccg aca gat gca aac gca cgt gca aaa gat gct cca gag    1837
His Ile Asn Pro Thr Asp Ala Asn Ala Arg Ala Lys Asp Ala Pro Glu
                575             580             585

gaa gag gca atg gaa tcc tct gtc agg gag gat gaa aac aag gcc aat    1885
Glu Glu Ala Met Glu Ser Ser Val Arg Glu Asp Glu Asn Lys Ala Asn
        590             595             600

ctg gac ccc agg ctt ttt gca gac gaa aga gag ata cag aat gcg gga    1933
Leu Asp Pro Arg Leu Phe Ala Asp Glu Arg Glu Ile Gln Asn Ala Gly
605             610             615             620

gac caa gct cag gag aac aga gca tct ggg aat gct ggc agt gct ggt    1981
Asp Gln Ala Gln Glu Asn Arg Ala Ser Gly Asn Ala Gly Ser Ala Gly
                625             630             635

gga caa agc ggg agc tcc aaa gtc cta ttc tcc acc ctg gtg ccc ctg    2029
Gly Gln Ser Gly Ser Ser Lys Val Leu Phe Ser Thr Leu Val Pro Leu
                640             645             650

ggt ttg gtg ctg gca gtg ggt gct gtg gct gtg tgg gtg gcc aga gtc    2077
Gly Leu Val Leu Ala Val Gly Ala Val Ala Val Trp Val Ala Arg Val
                655             660             665

cga cat cgg aag aat gta gac cgc atg tca atc agc agc tac agg aca    2125
Arg His Arg Lys Asn Val Asp Arg Met Ser Ile Ser Ser Tyr Arg Thr
        670             675             680

gac att agc atg gga gac ttc agg aac tcc agg gat ttg gga ggc aat    2173
Asp Ile Ser Met Gly Asp Phe Arg Asn Ser Arg Asp Leu Gly Gly Asn
685             690             695             700

gac aac atg ggc gcc act cca gac aca caa gaa aca gtc ctc gaa gga    2221
Asp Asn Met Gly Ala Thr Pro Asp Thr Gln Glu Thr Val Leu Glu Gly
                705             710             715
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aaa gat gaa ata gag act acc acc gag tgt acc acc gag cca gag gaa     2269
Lys Asp Glu Ile Glu Thr Thr Thr Glu Cys Thr Thr Glu Pro Glu Glu
            720             725             730

tcc aag aaa gca aaa agg tca tcc aag gag gaa gct gac atg gcc tac     2317
Ser Lys Lys Ala Lys Arg Ser Ser Lys Glu Glu Ala Asp Met Ala Tyr
            735             740             745

tca gca ttc ctg ttt cag tcc agc aca ata gct gcg cag gtc cat gat     2365
Ser Ala Phe Leu Phe Gln Ser Ser Thr Ile Ala Ala Gln Val His Asp
            750             755             760

ggt ccc cag gaa gcc tag gcagtgctga ccacctaccc ctgcctgtga           2413
Gly Pro Gln Glu Ala
765

caatcaactt gagaatcaca ttgatccact cgcagcccac cctcgcccat cacccaggct 2473

cttccctcct gttctcagag gtgtgctggt tcctccctca gtcgtggaag cctggcctac 2533

ttatgcctgt ttaggagaga gcgtgaggag ttcttttttgc tgttaaagag taaggtggaa 2593

atgagttgag cccaagaggt gtctctgaga gacgagggtt cagagcaggg gctcatttca 2653

ggaggaagag ccatttgaag cctctttata cacatatgct aggatgtcag gatagctctt 2713

ctcctccatc tctcctttct tctcttcttg attcagacaa cagatccgaa aactcactag 2773

gcttccggtg tctactaaat gctgagagtc aggccacagc ctttctataa acatcactgg 2833

aagagacacc acctcgtccc agattctgtc ttttccctaa gctatcaatc attaccgggg 2893

attccctttg cctctgcacc tcataggcaa caaaagaaac ataagtcctg cagtctaagg 2953

catacccaag ccataagggc accacgagac tcagatgaga agagattttt ctccagagta 3013

ctcagtgaga tagactagtg tcaagccaga tggggcaact cctggctctt ggcctgggac 3073

ttgtcttcaa gatctctgct cttattagag aaagaacttt agcatgagga aaagtaagag 3133

aaaacaagtt acatgggcat ggtggtgtgc tcctgcaatc ccaatattaa gaggttaaaa 3193

aataggacca gaagtttaaa gtaatccttg ctacctagt gagtgtaagg ccagcctgga 3253

atcaataaga gttggt                                                  3269


<210> 10
<211> 769
<212> PRT
<213> Rattus sp.

<400> 10
Met Arg Leu Ser Leu Phe Ala Leu Leu Val Thr Val Phe Ser Gly Val
1               5                   10                  15

Ser Thr Gln Ser Pro Ile Phe Gly Pro Gln Asp Val Ser Ser Ile Glu
            20                  25                  30
```

Gly Asn Ser Val Ser Ile Thr Cys Tyr Tyr Pro Asp Thr Ser Val Asn
       35   40   45

Arg His Thr Arg Lys Tyr Trp Cys Arg Gln Gly Ala Asn Gly Tyr Cys
      50   55   60

Ala Thr Leu Ile Ser Ser Asn Gly Tyr Leu Ser Lys Glu Tyr Ser Gly
65   70   75   80

Arg Ala Ser Leu Ile Asn Phe Pro Glu Asn Ser Thr Phe Val Ile Asn
            85   90   95

Ile Ala His Leu Thr Gln Glu Asp Thr Gly Ser Tyr Lys Cys Gly Leu
         100   105   110

Gly Thr Thr Asn Arg Gly Leu Phe Phe Asp Val Ser Leu Glu Val Ser
       115   120   125

Gln Val Pro Glu Phe Pro Asn Asp Thr His Val Tyr Thr Lys Asp Ile
     130   135   140

Gly Arg Thr Val Thr Ile Glu Cys Arg Phe Lys Glu Gly Asn Ala His
145   150   155   160

Ser Lys Lys Ser Leu Cys Lys Lys Arg Gly Glu Ala Cys Glu Val Val
         165   170   175

Ile Asp Ser Thr Glu Tyr Val Asp Pro Ser Tyr Lys Asp Arg Ala Ile
         180   185   190

Leu Phe Met Lys Gly Thr Ser Arg Asp Ile Phe Tyr Val Asn Ile Ser
       195   200   205

His Leu Ile Pro Ser Asp Ala Gly Leu Tyr Val Cys Gln Ala Gly Glu
     210   215   220

Gly Pro Ser Ala Asp Lys Asn Asn Ala Asp Leu Gln Val Leu Glu Pro
225   230   235   240

Glu Pro Glu Leu Leu Tyr Lys Asp Leu Arg Ser Ser Val Thr Phe Glu
         245   250   255

Cys Asp Leu Gly Arg Glu Val Ala Asn Asp Ala Lys Tyr Leu Cys Arg
         260   265   270

Lys Asn Lys Glu Thr Cys Asp Val Ile Ile Asn Thr Leu Gly Lys Arg
       275   280   285

Asp Pro Ala Phe Glu Gly Arg Ile Leu Leu Thr Pro Arg Asp Asp Asn
     290   295   300

Gly Arg Phe Ser Val Leu Ile Thr Gly Leu Arg Lys Glu Asp Ala Gly
305   310   315   320

His Tyr Gln Cys Gly Ala His Ser Ser Gly Leu Pro Gln Glu Gly Trp
         325   330   335

Pro Val Gln Ala Trp Gln Leu Phe Val Asn Glu Glu Ser Thr Ile Pro
            340   345   350

Asn Ser Arg Ser Val Val Lys Gly Val Thr Gly Gly Ser Val Ala Ile
            355   360   365

Val Cys Pro Tyr Asn Pro Lys Glu Ser Ser Ser Leu Lys Tyr Trp Cys
    370   375   380

His Trp Glu Ala Asp Glu Asn Gly Arg Cys Pro Val Leu Val Gly Thr
385   390   395   400

Gln Ala Leu Val Gln Glu Gly Tyr Glu Gly Arg Leu Ala Leu Phe Asp
            405   410   415

Gln Pro Gly Ser Gly Ala Tyr Thr Val Ile Leu Asn Gln Leu Thr Thr
            420   425   430

Gln Asp Ser Gly Phe Tyr Trp Cys Leu Thr Asp Gly Asp Ser Arg Trp
            435   440   445

Arg Thr Thr Ile Glu Leu Gln Val Ala Glu Ala Thr Lys Lys Pro Asp
    450   455   460

Leu Glu Val Thr Pro Gln Asn Ala Thr Ala Val Ile Gly Glu Thr Phe
465   470   475   480

Thr Ile Ser Cys His Tyr Pro Cys Lys Phe Tyr Ser Gln Glu Lys Tyr
            485   490   495

Trp Cys Lys Trp Ser Asn Asp Gly Cys His Ile Leu Pro Ser His Asp
            500   505   510

Glu Gly Ala Arg Gln Ser Ser Val Ser Cys Asp Gln Ser Ser Gln Ile
            515   520   525

Val Ser Met Thr Leu Asn Pro Val Lys Lys Glu Asp Glu Gly Trp Tyr
    530   535   540

Trp Cys Gly Val Lys Glu Gly Gln Val Tyr Gly Glu Thr Thr Ala Ile
545   550   555   560

Tyr Val Ala Val Glu Glu Arg Thr Arg Gly Ser Pro His Ile Asn Pro
            565   570   575

Thr Asp Ala Asn Ala Arg Ala Lys Asp Ala Pro Glu Glu Glu Ala Met
            580   585   590

Glu Ser Ser Val Arg Glu Asp Glu Asn Lys Ala Asn Leu Asp Pro Arg
            595   600   605

Leu Phe Ala Asp Glu Arg Glu Ile Gln Asn Ala Gly Asp Gln Ala Gln
    610   615   620

Glu Asn Arg Ala Ser Gly Asn Ala Gly Ser Ala Gly Gly Gln Ser Gly
625   630   635   640

```
Ser Ser Lys Val Leu Phe Ser Thr Leu Val Pro Leu Gly Leu Val Leu
                645             650             655

Ala Val Gly Ala Val Ala Val Trp Val Ala Arg Val Arg His Arg Lys
            660             665             670

Asn Val Asp Arg Met Ser Ile Ser Ser Tyr Arg Thr Asp Ile Ser Met
            675             680             685

Gly Asp Phe Arg Asn Ser Arg Asp Leu Gly Gly Asn Asp Asn Met Gly
    690             695             700

Ala Thr Pro Asp Thr Gln Glu Thr Val Leu Glu Gly Lys Asp Glu Ile
705             710             715             720

Glu Thr Thr Thr Glu Cys Thr Thr Glu Pro Glu Glu Ser Lys Lys Ala
            725             730             735

Lys Arg Ser Ser Lys Glu Glu Ala Asp Met Ala Tyr Ser Ala Phe Leu
            740             745             750

Phe Gln Ser Ser Thr Ile Ala Ala Gln Val His Asp Gly Pro Gln Glu
        755             760             765

Ala
```

```
<210> 11
<211> 322
<212> DNA
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Guy's 13 Kappa

<220>
<221> CDS
<222> (8)..(322)

<400> 11
ctcgagc gac att gtg atg acc cag tct cca gca atc atg tct gca tct    49
        Asp Ile Val Met Thr Gln Ser Pro Ala Ile Met Ser Ala Ser
        1               5                   10

cca ggg gag aag gtc acc ata acc tgc agt gcc agc tca agt gta agt    97
Pro Gly Glu Lys Val Thr Ile Thr Cys Ser Ala Ser Ser Ser Val Ser
 15                 20                  25                  30

tac atg cac tgg ttc cag cag aag cca ggc act tct ccc aaa ctc tgg   145
Tyr Met His Trp Phe Gln Gln Lys Pro Gly Thr Ser Pro Lys Leu Trp
                35                  40                  45

ctt tat agc aca tcc aac ctg gct tct gga gtc cct gct cgc ttc agt   193
Leu Tyr Ser Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser
            50                  55                  60
```

```
ggc agt gga tct ggg acc tct tac tct ctc aca atc agc cga atg gag    241
Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Met Glu
        65              70                  75

gct gaa gat gct gcc act tat tac tgc cat caa agg act agt tac ccg    289
Ala Glu Asp Ala Ala Thr Tyr Tyr Cys His Gln Arg Thr Ser Tyr Pro
    80              85                  90

tac acg ttc gga ggg ggg acc aag ctg gaa ata                        322
Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
95              100             105
```

```
<210> 12
<211> 105
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Guy's 13 Kappa

<400> 12
Asp Ile Val Met Thr Gln Ser Pro Ala Ile Met Ser Ala Ser Pro Gly
 1               5                  10                  15

Glu Lys Val Thr Ile Thr Cys Ser Ala Ser Ser Ser Val Ser Tyr Met
            20              25                  30

His Trp Phe Gln Gln Lys Pro Gly Thr Ser Pro Lys Leu Trp Leu Tyr
        35                  40                  45

Ser Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
    50                  55                  60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Met Glu Ala Glu
65                  70                  75                  80

Asp Ala Ala Thr Tyr Tyr Cys His Gln Arg Thr Ser Tyr Pro Tyr Thr
                85                  90                  95

Phe Gly Gly Gly Thr Lys Leu Glu Ile
            100             105
```

```
<210> 13
<211> 402
<212> DNA
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Guy's 13 Gamma 1

<220>
<221> CDS
<222> (7)..(402)
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<400> 13
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ctcgag atg gaa tgg acc tgg gtt ttt ctc ttc ctc ctg tca gga act      48
        Met Glu Trp Thr Trp Val Phe Leu Phe Leu Leu Ser Gly Thr
         1               5                   10

gca ggc gtc cac tct ggg gtc cag ctt cag cag tca gga cct gac ctg     96
Ala Gly Val His Ser Gly Val Gln Leu Gln Gln Ser Gly Pro Asp Leu
 15                  20                  25                  30

gtg aaa cct ggg gcc tca gtg aag ata tcc tgc aag gct tct gga tac    144
Val Lys Pro Gly Ala Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr
                    35                  40                  45

aca ttc act gac tac aac ata cac tgg gtg aag cag agc cgt gga aag    192
Thr Phe Thr Asp Tyr Asn Ile His Trp Val Lys Gln Ser Arg Gly Lys
                50                  55                  60

agc ctt gag tgg att gga tat att tat cct tac aat ggt aat act tac    240
Ser Leu Glu Trp Ile Gly Tyr Ile Tyr Pro Tyr Asn Gly Asn Thr Tyr
             65                  70                  75

tac aac cag aag ttc aag aac aag gcc aca ttg act gta gac aat tcc    288
Tyr Asn Gln Lys Phe Lys Asn Lys Ala Thr Leu Thr Val Asp Asn Ser
         80                  85                  90

tcc acc tca gcc tac atg gag ctc cgc agc ctg aca tct gag gac tct    336
Ser Thr Ser Ala Tyr Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser
 95                  100                 105                 110

gca gtc tat tac tgt gca acc tac ttt gac tac tgg ggc caa ggc acc    384
Ala Val Tyr Tyr Cys Ala Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr
                115                 120                 125

act ctc aca gtc tcc tca                                            402
Thr Leu Thr Val Ser Ser
            130
```

<210> 14
<211> 132
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: Guy's 13 Gamma 1

<400> 14
```
Met Glu Trp Thr Trp Val Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
 1               5                   10                  15

Val His Ser Gly Val Gln Leu Gln Gln Ser Gly Pro Asp Leu Val Lys
                20                  25                  30

Pro Gly Ala Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe
            35                  40                  45

Thr Asp Tyr Asn Ile His Trp Val Lys Gln Ser Arg Gly Lys Ser Leu
         50                  55                  60
```

```
Glu Trp Ile Gly Tyr Ile Tyr Pro Tyr Asn Gly Asn Thr Tyr Tyr Asn
 65                  70              75                  80

Gln Lys Phe Lys Asn Lys Ala Thr Leu Thr Val Asp Asn Ser Ser Thr
             85              90                  95

Ser Ala Tyr Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ala Val
        100             105             110

Tyr Tyr Cys Ala Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu
        115             120             125

Thr Val Ser Ser
    130
```

<210> 15
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 15
accagatcta tggaatggac ctgggttttt c   31

<210> 16
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 16
cccaagcttg gttttggaga tggttttctc   30

<210> 17
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 17
gataagcttg gtcctactcc tcctcctcct a   31

<210> 18
<211> 30

```
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 18
aatctcgagt cagtagcaga tgccatctcc                              30


<210> 19
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 19
ggaaagcttt gtacatatgc aaggcttaca                              30
```